

CMOS-MEMS Microgravity Accelerometer with High-Precision DC Response, Phase I

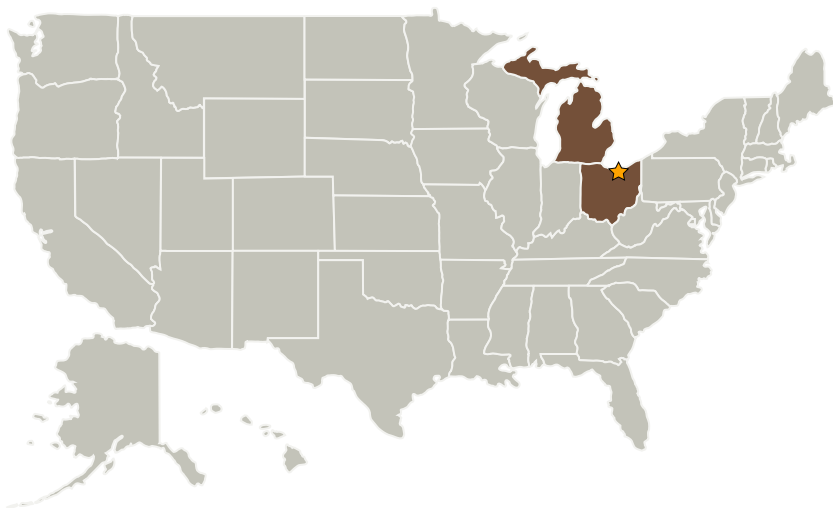
Completed Technology Project (2005 - 2005)



Project Introduction

This Phase I SBIR effort initiates development of a high-sensitivity low-noise all-silicon CMOS-MEMS accelerometer for quasi-steady measurements of accelerations at sub 1 micro-g levels. The accelerometer module includes integrated low-noise CMOS circuitry with active offset and low-frequency noise cancellation to enable high-precision DC measurements. The high-performance of the sensor is enabled by innovation in both MEMS accelerometer and readout circuit technologies: i) Single-crystalline silicon capacitive accelerometer structure. The device has high sensitivity and low thermo-mechanical noise; ii) Innovative high-yield fabrication process that enables formation of high-sensitivity devices on top of CMOS wafers; iii) New and improved low-noise capacitive sensor readout CMOS circuit. This novel microaccelerometer has several NASA applications including measurement of residual accelerations on spacecraft and ground-based low-gravity facilities.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Evigia Systems, Inc.	Supporting Organization	Industry	Ann Arbor, Michigan



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

Michigan

Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Navid Yazdi

Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
 - └ TX17.2 Navigation Technologies
 - └ TX17.2.3 Navigation Sensors